International PV Module QA Task Force: Thin-Film Task Group Kickoff Meeting

Notes from the Thursday afternoon discussion session

Discussion: Which accelerated stress tests have been useful for particular thin film constructions?

Discussion Leader – Kurt Scott of Atlas; Scribe – David Burns of 3M

Shall we us a black box approach or a test designed specifically to create known failures?

Must be black box approach – if stress test targets only known failures, there is significant risk that others will be missed.

Which tests are crucial for thin-film (TF) PV?

How do we test for glass breakage – a pretty dominant failure rate with TF PV?
Suggest – clamp (restrain) modules in thermal cycle chamber.
Specific cracking issue - measure amount of temper in glass - test glass after its made into a module

Cracking caused by different sources – some from hot spots
Strength of glass is critical – best to measure both before and after it's placed in module – must measure good statistical samples

Damp heat testing of vertically oriented modules actually strengthen glass – not seen on field –the qualification test sequence should be changed to account for this effect.

Test glass at high temperature with module under restraint in order to test stress caused by temperature gradient
Use GAS – grazing angle surface polarimetry – to test stress in glass
Note edge treatment of glass before it is tempered.

What about flexible modules? How do you test to make sure they are ok?
Roll over a spool forward and backward many times; look at degradation to thermal cycling after bending to exacerbate effect.

Hail impact on flexible PV is important
Must understand the end use application – roof or tent/ back pack, etc. to choose appropriate test.
Use military test for rolling.
Shall we make a squirrel test?? To be considered later, perhaps.
Shading sensitivity is different in TF than for crystalline Si; Is effect important enough to have separate discussion?
Should be shading and soiling, bird dropping, etc. tested together – effects are very important.
"If you shade module 'hard enough,' you will kill module."